

**UNIVERSITY OF MEDICINE AND PHARMACY CRAIOVA**

**CATEGORIES: MEDICINE**

## **THESIS DOCTORATE - RESUME**

**STUDY ON THE CONTRIBUTION OF PHYSICAL BALNEAR  
THERAPY ON PATIENTS WITH PATHOLOGY CONFOUNDING  
CEREBROVASCULAR AND DEGENERATIVE RHEUMATIC**

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## INTRODUCTION

The patient with associated polyopathy: degenerative rheumatic and complex neurological, sequel stroke type, represents not only a public health issue, but also one of the personal and family one, through the prism of a marked damage of the functionality and quality of life.

Osteoarthritis, with its various locations, is among the most disabling conditions of health, its impact can be devastating, considering the advanced age of people affected, and more often not single, with important implications in the socio-economic change.

Although it is considered a “normal” process of aging, in the context of the general evolution of life, osteoarthritis has a worrisome increase in frequency, affecting age getting younger, with devastating effects over time, exacerbated by the associated pathology of cardio-vascular area.

Squeals of the stroke, the leading cause of disability in the world, have a significant impact on the functionality of the individual, its quality of life, but also a marked damage of the social component.

A complex approach to the patient with associated polyopathy, degenerative rheumatic, neurological sequelae and hemiparesis after stroke, is urgently needed, in terms of diagnosis, evaluation and adoption of appropriate and essential therapeutic conduit for monitoring the various forms of treatment.

A successful recovery means more than to help individuals reach their peak physical capacity, involves development and improving the quality of life.

This study, is trying to emphasize the aspects mentioned above, for a population with special features, such as the one in southern Romania, and the complex therapeutic and diagnose approach, to obtain some pertinent conclusions with immediate practical applicability.

### STROKE SEQUELAE

Strokes in Romania represent the third cause of mortality after cancers and cardiovascular diseases.

The incidence of stroke varies in different European countries, being estimated at 100 to 200 new strokes/100,000 inhabitants/year.

This is a huge burden economically and socially speaking.

The term of *cerebrovascular disease*, expresses transitional or permanent disorders, existing in an area of the brain, produced by an ischemia and/or a hemorrhage, where the primary pathologic process affects one or more of the cerebral vessels.

Occurring on pre-existing associated polypathological land, strokes take different forms, multiple squeals affecting , sometimes irreversible, not only the individual and his/her quality of life, but with important socio-economic repercussions.

Quality of life is a complex, dynamic collection of objective and subjective dimensions, social and individual, positive and negative, which are continuously interacting.

A successful recovery of patients with stroke sequels does more than help individuals reach their peak physical capacity, involves development and improving the quality of life, one of the most important individual and complex therapeutic components.

An individual's perception of the quality of life is among the most important determinants of demand for services, a compliance to seek treatment, satisfaction with treatment followed and the services provided.

The way in which some individuals evaluate of the impact of their state on the quality of life is determined by how the perception of control over life circumstances.

A proper knowledge of the condition and treatment, together with an active participation in making decisions for the therapeutic management, can make patients with a chronic and disabling disease, to make decisions that will allow them to improve the quality of life in terms of needs, goals and circumstances.

Treatment of patient with stroke sequel will be individualized and adapted to its clinical and functional status.

The patient compliance should be provided by means of discussions in which it is explained that this is a disabling disease, long lasting, whose evolution can be slowed through a proper and persistent treatment, and the establishment of it are factors of major importance for the therapeutic success.

Complex evaluation of patients with stroke sequels is essential for monitoring the various forms of

treatment,elaborating a large number of variables capable to measure different aspects of the disease.

## ARTHROSIC DISEASE

Arthrosis is a degenerative arthropathia, multifactorial and heterogeneous, characterized by progressive degradation of articular cartilage, accompanied by a hypertrophic reaction of the subchondral bone that makes the bone and cartilage not to form and varied reactions of other joint structures (capsule, synovium, meniscus). Clinically, the disease is characterized by severe pain, deformity and limitation of movement in the affected joints. In the Anglo-Saxon literature, arthrotis are described under the name of osteoarthritis or deforming arthritis.

Arthrosis is by far the most common joint pain and the second leading cause of disability in people over 50 years of age, after ischemic coronary heart disease, which entail an enormous economic impact and transform into a real public health problem.

The most common arthrosis are the ones of the joints that have to bear large loads: lower limb joints (knees, hips) and the lumbar spine. Arthrosis usually affects only one joint and the disease can remain for a long time only at this level.

In general, individuals who are over 40-50 years are affected; sometimes, arthrosis can occur under this age if there are some pathogenic factors: congenital malformations, trauma, arthritis, early menopause.

The arthrosis disease is asymptomatic for a long time. The onset is slow, insidious, and the sufferer is unable to indicate the appearance of the first symptoms. Most times, when attending the doctor, the clinical picture is already set up, and many of the changes are irreversible. The patient has a good general condition and is often obese. There are general symptoms (fatigue, anorexia).

*Articular pain* it is by far the most important symptom of the disease. It presents the following characteristics: it is the leading cause of chronic pain in the elderly, is more obvious in women, has variable intensity depending on the individual, but also by location (hips hurt most, hands less), is meteorological addiction (cold and moisture make it worse). Normally, appears and grows in effort and improves in repose, but 30% of patients have also nocturnal and repose pain. There is no correlation between the intensity of the pain and severity of radiological changes.

The pains, usually of moderate intensity, are more vivid in active arthrosis. The pain that appears in movement is connected more to enthesopathy and mechanical factors; the repose pain is correlated with the presence of inflammation, and night pain (with a more severe prognosis) is caused by the intra-osseous hypertension. In relation to the evolution of the disease, Wagenhäuser described the two triads of arthrosis pains:

- 1.) Early triad: early movement pain(start pain), fatigue pain and stress pain;
- 2.) Late triad: long lasting pain, night pain and muscle pain (local).

The articular cartilage, the main structure of the affected arthrosic process, it is not innervated, but for the arthrosis pain to appear, contributes many factors:

a.) mechanical factors affecting the joint shape, the presence of osteophytes, joint damages cause the appearance of abnormal forces which, applied on neighboring structures (capsule, ligaments), richly innervated, cause pain.

b.) bone factors: micro fractures in the subchondral bone occurred due to lower resistance and increased pressure at this level causes pain. Add to this venous flow obstruction, an incriminated mechanism in the occurrence of nocturnal pain.

c.) synovial factors: easier synovial inflammation, plus bursitis, enthesitis contributes to the pain.

d.) muscular factors: reflex muscle contraction, in a first step, and muscle atrophies in late stage, also contribute to pain

e.) neurological factors: compression exerted by the affected intervertebral disc generates significant pain.

*The joint stiffness*, difficulty felt at the beginning of movement or the joints "heating" process after a prolonged rest is the preserve of inflammatory joint pain. It can occur in arthrosis, but unlike inflammatory arthropathy, is of short duration (no more than 5-30 minutes).

*The reduced mobility* is antalgic in the beginning, the patient involuntarily trying not to require joints, to not cause pain, especially to some moves that cause pulling the capsule, tendons, and ligaments. Later other causes joint: the presence of osteophytes, the destruction of cartilage and subchondral bone, thickening of the

capsule, joint deformations, muscular atrophies and ultimately, ankylosis. *Functional impotence*, to varying degrees, is also the result of the above changes.

Clinical examination of a sick arthrosic may highlight the sensitivity to palpate the bony edges and the joint interlining, the increasing volume of the joints (by proliferative changes of the subchondral bone), discrete swelling of soft tissue, small crepitation, and later crackles caused by active or passive mobilization of the joint. The clicking (crackles) is due to irregularities on the joint surfaces that come in contact and poor quality cartilage that does not ensure the slipping of joint surfaces

Deformation and enlargement of the joint are determined by the exuberant osteochondral proliferations and by the association of synovial effusion due to irritation. Arthrosis often has congestive outbursts that are triggered by "articular mice" which are cartilage fragments detached and migrated into the joint cavity, or by the precipitation of hydroxyapatite crystals or calcium pyrophosphate. This situation is expressed clinically by recrudescence of pain, increased local temperature, possibly an exudative reaction with the increasing amount of synovial fluid.

## **THE PURPOSE OF THE STUDY**

The aim of the thesis is to evaluate both overall and in comparison the results of the physical-balneary therapy. This is a part of the sustained rehabilitation treatment in the case of the patients with complex pathology, residual hemiparesis and IPSI arthrosis disease - and/or contralateral associated, such as gonarthrosis, coxarthrosis, and hands arthrosis, degenerative stenosis of the cervical spinal canal or lumbar, cervical, thoracic or lumbarin spondyloarthrosis. The therapy took place in two health resorts, Calimanesti-Caciulata and Sacelu-, both with indications in both neurological pathology of central type and degenerative rheumatic pathology, but one national and the other local interest.

In achieving its goal, the study focused on the simultaneous application of hemiplegic evaluation form, Visual Analog Scale and Scale FES-I, means for monitoring the patient but also of therapeutic program continuously adaptation to the individual needs, taking into account the existing functionality deficits at a time.

## MATERIAL AND METHOD

A number of 548 patients diagnosed with associated arthrosis disease and residual hemiparesis accepted to participate and went to the end of a prospective study. They followed a rehabilitation treatment in a health resort.

During the study, 13 patients have dropped out for various non-medical reasons.

Patients who have suffered a stroke in the past and are known to have the IPSI arthrosis disease - and/or contra lateral (gonarthrosis, coxarthrosis, hands arthrosis, degenerative stenosis of the cervical spinal canal or lumbar, cervical, thoracic or lumbar spondylo-arthritis). The study took place between March 2005 and March 2012.

The study included a total of 284 male patients and 251 female patients, data illustrated in table 8 and Figure 17.

We evaluated 535 patients with after-stroke residual hemiparesis and IPSI arthrosis disease - and/or contra lateral.

All those 535 patients were initially evaluated (evaluation 1) by internment in a specialized clinic or department out of which 179 patients in the Clinical County Hospital Ilfov, 153 patients within the Emergency County Hospital Valcea, 117 patients in the Emergency County Hospital Targu-Jiu and 47 patients within the Emergency Clinical County Hospital Craiova. The lowest numbers of patients, 39, were hospitalized in the Municipal Clinical Hospital of Emergency Timisoara.

Patients followed two cures: at six months and twelve months after the initial evaluation, the having the final re-evaluation at not less than six months after the last cure spa (evaluation 2, performed at 6 months after admission into the department or special clinic. Evaluation 3 was made at 12 months after the first evaluation and first six months after the second. The resort recovery doctor performed the evaluations. Evaluation 4 was made at 6 months after the second health cure, by the special doctor from the department or clinic where was evaluated initially).

The distribution of patients according to the arthrosic damage showed that 126 patients had uni- or bilateral coxarthrosis and 119 patients had uni-or bilateral gonarthrosis. Coxarthrosis stage and gonarthrosis stage was early or medium, an endoprosthetics surgery not being necessary.

131 patients have presented spondylodiskarthrosis with multiple locations (cervical, dorsal or lumbar). 159 patients were diagnosed with polyarthritis disease, namely polyarticular arthrosic damages at spine, hip, knee or hand.

Depending on the environment origin, the batch trial included 294 patients from urban areas and 241 patients from rural areas.

Patients included in the study were aged between 40-59 years old with an average of 51,04 and a standard deviation of 5,211.

All the subjects evaluated have received detailed information about the methodology of the study. Patients signed an informed consent concerning the enrollment in the study. Patients were divided into two study groups.

Group 1 consisted of 215 patients who attended a rehabilitation treatment in a specialized unit type in-patient hospitalization and health resort Sacelu. This last rehabilitation therapy, was held as two annual courses, namely in the form of 14 daily sessions at an interval of 6 months.

Group 2 consisted of 320 patients who attended a rehabilitation treatment in a specialized unit type in-patient hospitalization and health resort Călimănești. The rehabilitation therapy in the resort, took place as two annual courses, namely in the form of 14 daily sessions at an interval of 6 months.

All patients of both groups followed four successive assessments, respectively at baseline, after 6 months, a year and at the end of the study after 18 months. They were evaluated by VAS (visual analog scale) for pain and a questionnaire (hemiplegic patient evaluation form and Falls Efficacy Scale). The evaluation forms were used depending on the stage of recovery (as presented in Annex).

FEH Scale (61) is a scale with more parameters that monitors and evaluates the functional status of the hemiplegic patient.

VAS (160), one of the rating scales based on verbal communication, is a tool for unidimensional measuring of the pain intensity, being appreciated with values between 1 and 10.

FES scale (156) is an instrument that measures fear of falling of a person, an instrument based on the operational definition of this fear, perceived as low self-efficacy to avoid falling while performing essential non-dangerous everyday activities.

Patients received:

1. Proper hygienic-dietary treatment corresponding to existing underlying disease and comorbidities.

2. Drug treatment: pain relievers, anti-inflammatory, decontracturant, chondroprotective, anti-hypertensive, cardiac glycosides, diuretics, cholesterol-lowering, hypoglucidic, brain food, as prescribed.

3. Recovery Treatment

## CONCLUSIONS

1. Prospective study conducted in the thesis included a total of 535 patients diagnosed with residual hemiparesis and associated arthrosic disease, patients who undergo medical rehabilitation treatment in a profile health resort. Patients have suffered a stroke in history and are known with IPSI- arthrosis disease and / or contralateral (gonarthrosis, coxarthrosis, hands arthrosis, degenerative stenosis of the cervical spinal canal or lumbar, cervical, thoracic or lumbar spondyloarthrosis). The study was conducted between March 2005 and March 2012.

2. Patients were divided into two study groups. Group 1 consisted of 215 patients who undergo rehabilitation treatment in a specialized unit type in patient hospitalization (1 cycle per year) and Sacelu health resort. This last remedial therapy was conducted as two annual courses, namely in the form of 18 daily sessions at an interval of 6 months. Group 2 included a total of 320 patients who undergo rehabilitation treatment in a specialized unit type in-patient hospitalization (1 cycle per year) and health resort Călimănești. Rehabilitation therapy in the resort took place as two annual courses, namely in the form of 18 daily sessions at an interval of 6 months.

3. All patients of both groups followed four successive evaluations, respectively at baseline, after 6 months, a year and at the end of the study after 18 months. They were evaluated by VAS (visual analog scale) for pain

and questionnaire FEH (hemiplegic patient evaluation score) and FES-I questionnaire.

4. Group 1 included a total of 112 men and 103 women. Patients were divided into three age groups: 40-44 years group (29 patients), group 44-49 years (54 patients) and the group over 50 years (132 patients).

In none of the initial assessments, intermediate (6 months and 12 months) and final no statistically significant differences were observed between the sexes for VAS score, for torso and lifting score, legs and stand position score, the upper limbs-prehension score, for recovery-balance score, for walking on flat ground score, for adapting to obstacles score and upper limb score ( $p < 0.05$ ). Also, none of the four assessments there were no differences statistically significant between age groups within Group 1 for VAS score and score FEH ( $p > 0.05$ ).

5. Group 2 consisted of 172 men and 148 women. Patients were divided into three age groups: 40-44 years group (47 patients), group 44-49 years (80 patients) and the group over 50 years (193 patients).

In none of the initial assessments, intermediate (6 months and 12 months) and final no statistically significant differences were observed between the sexes for VAS score, for torso and lifting score, legs and stand position score, the upper limbs-prehension score, for recovery-balance score, for walking on flat ground score, for adapting to obstacles score and upper limb score ( $p < 0.05$ ). Also, none of the four assessments there were no differences statistically significant between age groups within Group 2 for VAS score and score FEH ( $p > 0.05$ ).

6. There was performed a mixed analysis of variance between groups and serial assessments to determine the impact that they have two types of therapies on the average score measured in phase I, measured in four serial assessments. One can observe a statistically significant interaction between type of therapy and time (Wilks  $\lambda= 0.983$ ,  $F(3,531) = 3.03$ ,  $p < 0.001$ ) for both groups observing a significant increase in score for stage I. The comparison of the two types of interventions show that differences between therapies are not statistically significant. For both groups, mean score increased significantly between Phase I assessments ( $p < 0.001$ ).

7. There was performed a mixed analysis of variance between groups and serial assessments to determine the impact that they have two types of therapies on the average score measured in phase II, measured in four serial assessments. One can observe a statistically significant interaction between type of therapy and time (Wilks  $\lambda= 0.976$ ,  $F(3,531) = 4.41$ ,  $p < 0.001$ ) for both groups observing a significant increase in score for stage II. The comparison of the two types of interventions show that differences between therapies are not statistically significant. For both groups, mean score increased significantly between Phase II assessments ( $p < 0.001$ ).

8. There was performed a mixed analysis of variance between groups and serial assessments to determine the impact that they have two types of therapies on the average score measured in phase III, measured in four serial assessments. One can observe a statistically

significant interaction between type of therapy and time (Wilks  $\lambda = 0.976$ ,  $F(3,531) = 4.36$ ,  $p < 0.001$ ) for both groups observing a significant increase in score for stage III. The comparison of the two types of interventions show that differences between therapies are not statistically significant. For both groups, mean score increased significantly between Phase III assessments ( $p < 0.001$ ).

9. There was performed a mixed analysis of variance between groups and serial assessments to determine the impact that they have two types of therapies on the average score measured in phase IV, measured in four serial assessments. One can observe a statistically significant interaction between type of therapy and time (Wilks  $\lambda = 0.014$ ,  $F(3,531) = 12786,94$ ,  $p < 0.001$ ) for both groups observing a significant increase in score for stage IV. The comparison of the two types of interventions show that differences between therapies are not statistically significant ( $p < 0.05$ ). Comparing the two types of interventions shows that statistically significant differences between therapies, group 2 having significantly lower VAS score than group 1, but the differences between them is very small effect. For both groups, mean VAS score between assessments significantly lower ( $p < 0.001$ ).

10. Due to its highly varied ways such electrotherapy, massage, physical therapy, mud therapy and hydrokinetotherapy, remedial therapy is an important therapeutic tool in the management of the patient with neurological and rheumatic pathology associated. The

physical –kinetic therapy followed at 6 months in a specialized recovery clinic has proven effective in reducing pain and improving general health in patients with residual hemiparesis and arthrosic disease.

11. Throughout the study there were no patients to abandon treatment recovery complex due to the nature of cardiovascular events.

12. Analysis of the obtained data allows inferring the existence of equivalent close similarities between the therapeutic benefits offered by resorts Călimănești and Sacelu.

13. This study is the first of its kind conducted so far. The complexity of the topic, the multiple data obtained and integrated into the final enunciations, rigorous and concise entitle our hope that the study is reference material for specialty papers in the future.

## PROPOSALS

1. I suggest that patients with residual hemiparesis, aged 40 years, with associated arthrosic disease to follow a complex and long medical rehabilitation program, associating hospitalization in a specialized clinic or a ward with a health resort therapy (spa cure) biannual.
2. I propose, that in evaluating a patient with residual hemiparesis and associated arthrosic disease, included in a recovery program, to use the hemiplegic assessment sheet, VAS and questionnaire FES-I. These are tools for tracking patient evolution and change in the dynamics of the system treatment according to most affected functional activities, whether they involve the upper limbs, lower limbs, torso or global activities.
3. Hemiplegic evaluation sheet with its component parts, aim to be used as a kinetotherapy program at home, after it was learned correctly and practiced in the presence of a specialist physiotherapist. Low complexity and difficulty of this scale allow me to recommend it as part of adapted kinetotherapy program at home, not only as a complex method of functional assessment of the patient with stroke sequels.
4. Based on all the information contained in the present study and based on the data obtained we propose that the resort Sacelu be approached with great interest by the local and central authorities. Sacelu should be included in the infrastructure development programs and related

areas of the resort and establish a center (point) for cardiovascular monitoring, final target being the transformation of the local and seasonal status in one of national interest and permanent interest.

5. Romania is a member state of the European Union, which is why it is now possible to attract European funds that would allow investment, especially in the areas of climate spas, Sacelu being one of them. By attracting European funds, the elderly patient quality of life, who is the main beneficiary of this treatment, would increase.